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DISTRIBUTION, INCIDENCE AND DAMAGE CAUSED BY THE PITCH CANKER FUNGUS ON SLASH AND LONGLEAF PINE, APALACHICOLA NATIONAL FOREST, FLORIDA 1978

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DISTRIBUTION, INCIDENCE AND DAMAGE CAUSED BY THE PITCH CANKER FUNGUS ON SLASH AND LONGLEAF PINE, APALACHICOLA NATIONAL FOREST, FLORIDA 1978

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ABSTRACT

Pitch canker incidence was determined on the Apalachicola National Forest during May 1978. All of the stands with infected trees were 11-19 year old planted or seeded slash pine with an average of 25 percent infection. The average diameter of infected and noninfected trees were not statistically different. There were no major differences when infection was measured by percent basal area infected rather than percent of trees infected. Pitch canker seems to be lower than the 1976 survey. No adjustments in stand rotations are needed unless the disease intensifies.

Pitch canker, caused by Fusarium moniliforme var subglutinans, has caused substantial growth losses, deformity, and mortality in planted slash pine in Florida for several years. Several hundred acres of slash pine have been harvested prior to their projected rotation because of this disease. The National Forests in Florida were surveyed in 1976 to determine the incidence and distribution of pitch canker in slash pine. They found that the only forest with enough pitch canker to be concerned about was the Apalachicola. Most of the stands with infected trees were 11-16-year-old planted or seeded slash pine with an average of 33.6 percent of the trees infected per stand (1). This 1978 survey was made on the Apalachicola National Forest to determine the change in incidence and better define the distribution and impact on slash and longleaf pine.

RESULTS

The Apalachicola National Forest was surveyed during May 1976.

The forest was grided on a secondary road system with a 5-mile intersect between roads and 3 miles on a road. The survey was started on the northeastern corner of the forest and worked west. The first pine stand found along the road system was examined using the Yandle-Roth ratio estimation survey method (2). A distance of 3 miles was maintained between stands. Since preliminary data indicated a low occurrence of pitch canker in longleaf, only five longleaf stands were examined on each of the two ranger districts. Twenty-five slash pine stands were examined on each district. The following data were collected in each stand:

1. Type of stand (plantation, seeded or natural).
2. Length and width of each intersect.
3. Stand age by increment boring three dominant trees.
4. Infection on each tree by type:
    a. Healthy
    b. Loss of current terminal from pitch canker.
    c. Loss of older terminal from pitch canker.
    d. Less than 10 percent loss of foliage area.
    e. Between 11-25 percent loss of foliage area.
    f. Over 25 percent loss of foliage area.
    g. Dead from pitch canker.
    h. Dead from other than pitch canker.
5. Diameter at breast height.
6. Location of each stand on a map.

RESULTS

None of the longleaf pine stands sampled were infected. The slash pine stands examined ranged in age from 3 to 65. Forty-two percent of these

stands were infected. All of the slash pine stands with infected trees were planted or seeded and ranged in age from 9 to 20 years old. Ninety-five percent of these stands had at least 4 percent of the trees infected (Table 1). The infected stands occurred throughout the Forest (Figure 1) with a heavier concentration on the Apalachicola Ranger District. An average of 24 percent of the stems were infected per stand with infected trees with a high of 65 percent in one 16-year-old plantation (Table 2). There was no significant difference between the average diameter of infected and noninfected trees (3.2 for infected and 3.0 for noninfected $t = 0.961$). An average of 5 percent of the infected trees had lost their current terminal with a high of 16 percent for one stand. An average of only 3 percent of the trees had lost their current and old terminal with a high of 19 percent for one stand. Most of the infected trees had less than 10 percent loss of foliage area and mortality occurred in only one stand (1 percent). There were no major differences when infection was measured by percent basal area infected rather than percent of trees infected (Tables 2 and 3).

DISCUSSION

With so little mortality or loss of foliage area per tree, the major impact is deformity. Even though we did not make height measurements, the infected trees appeared to be about as tall as the noninfected trees. This may be the result of winter death of the terminal shoot with an immediate flush in the spring.

It is difficult to make comparisons between this survey and the 1976 survey. The 1976 survey showed 6.4 percent of the trees infected in the 5-10 year class, 33.6 percent in the 11-16 year class and 1.2 percent in the 17-22 year age class. We found the infected stands to range in age from 11-19 with an average infection of 25 percent in the infected stands. If the classes are grouped as they were in the 1976 survey, 1 percent of the trees were found infected in the 5-10 year age class, 14 percent in the 11-16 year age class and 14 percent for the 17-20 year age class. By comparing the current terminal loss with older terminal loss and the 1976 survey versus this survey, we conclude that overall pitch canker is lower with a few minor exceptions such as stand 1 (Table 2). Even in the heaviest infected stands the uninfected portion of the stand will carry the stand to rotation with the only losses occurring in the thinnings.

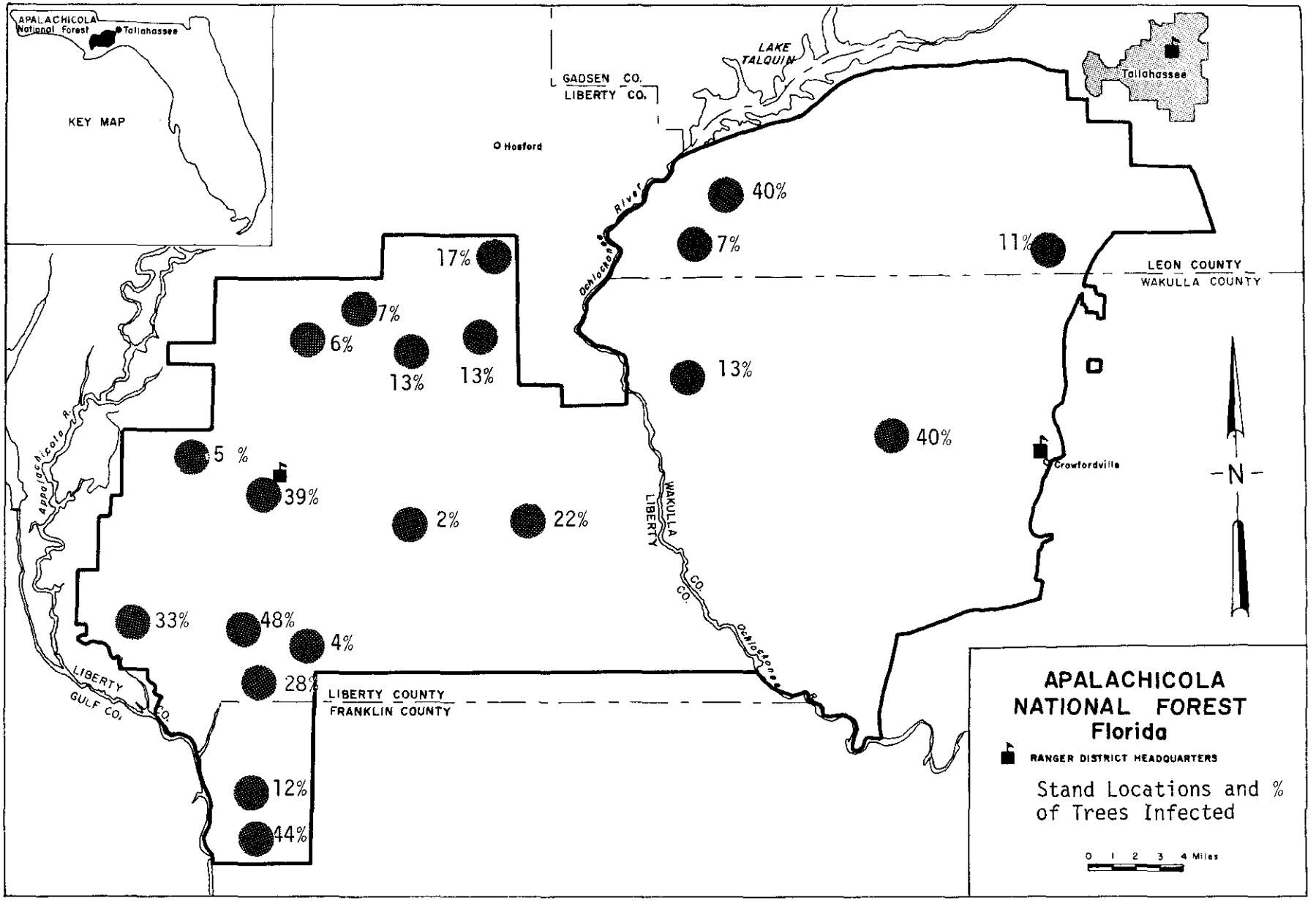

Figure 1--Approximate location of the 21 slash pine stands with pitch canker located during the 1978 survey on the Appalachicola National Forest.

Table 1. Number and percent of slash pine stands infected by *Fusarium moniliforme* var. *subglutinans* by age and type of stand on the Apalachicola National Forest, Florida - 1978.

Stand Age	No. Stands Observed	No. Stands Infected	% Natural	% Planted	% Natural Infected	% Planted Infected
1-10	15	1	0	100	0	7
11-20	23	20	4	96	0	96
21-30	5	0	20	80	0	0
31-40	3	0	66	34	0	0
41-65	6	0	66	34	0	0

Table 2. Age and percent infection in number of trees by stand and type of symptom for infected stands on the Apalachicola National Forest, Florida - 1978.

Stand	Age	% infection	% new terminal loss	% old terminal loss	% old and new terminal loss	% less than 11% foliage loss	% between 11-25% foliage loss	% over 25% foliage loss	% dead from pitch canker
1	13	48	27	12	7	39	6	1	0
2	11	28	11	12	4	20	3	1	0
3	19	17	1	5	0	13	1	0	0
4	15	22	10	11	4	13	3	2	0
5	13	13	3	8	2	8	2	1	0
6	9	13	5	9	4	8	1	1	0
7	13	8	0	4	0	4	1	0	0
8	11	4	1	1	0	2	0	0	0
9	12	4	1	2	0	3	0	0	0
10	12	7	2	2	1	7	0	0	0
11	19	11	3	10	3	6	1	0	0
12	12	10	2	6	1	5	1	0	0
13	12	44	12	29	6	29	6	2	1
14	13	14	5	7	2	9	0	0	0
15	11	11	1	3	1	10	0	0	0
16	15	12	6	3	1	10	1	0	0
17	15	40	4	22	3	33	3	1	0
18	20	35	0	0	0	46	5	0	0
19	13	39	12	11	4	31	3	1	0
20	16	65	4	21	1	29	3	0	0
21	19	56	3	14	1	32	3	1	0
Average		24±3.9 1/	5±1.3	9±1.6	3±.4	17±2.9	2±.3	1±.14	0

1/ Standard error of the mean - ± 1.

Table 3. Age and percent infection in basal area by infected stand and type of symptom for infected stands on the Apalachicola National Forest, Florida - 1978.

Stand #	% infection	% new terminal loss	% old terminal loss	% old and new terminal loss	% less than 11% foliage loss	% between 11-25% foliage loss	% over 26% foliage loss	% dead from pitch canker
1	46	13	27	19	53	16	1	0
2	21	16	11	4	17	3	1	0
3	18	1	6	1	15	2	0	0
4	16	5	18	4	11	3	1	6
5	13	5	8	3	8	2	2	0
6	9	4	7	3	8	2	1	0
7	6	0	3	0	5	1	0	0
8	3	1	1	0	1	0	0	0
9	5	1	3	0	4	0	0	0
10	8	3	3	1	8	0	0	0
11	10	3	9	3	7	1	0	0
12	10	2	5	1	5	1	0	0
13	43	13	31	7	30	5	2	1
14	14	6	7	3	9	0	0	0
15	10	1	3	1	9	0	0	0
16	12	5	4	1	12	1	0	0
17	42	3	19	3	29	2	0	0
18	32	0	0	0	43	5	0	0
19	37	11	10	4	29	3	1	0
20	66	4	19	1	28	3	0	0
21	59	3	15	1	34	2	1	0
Average		5±1.0 1/	10±.8	3±2.8	17±3.1	3±.7	1±.2	0

1/ Standard error of the mean - t±1.

ACKNOWLEDGEMENTS

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